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KRT 127
THM-TG REPLACEMENT RECEIVER
MINIMUM PERFORMANCE SPECIFICATION

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REVISION HISTORY

Revision	Change Order Number	Date
00	Original Issue	June, 1995

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1. PURPOSE

The purpose of this document is to specify the Minimum Performance Standards of the Allied Signal General Aviation Avionics KRT 127. Prior to being placed into finished goods, it shall be verified by individual testing that each unit conforms to the specifications and Minimum Performance Standards as defined in this document. This specification assumes that the performance of the RT-1594/PRC-127 is verified to be in conformance with USACECOM Specification A3186103 prior to incorporation into the KRT 127.

Paragraphs marked with an asterisk (*) are parameters which shall be tested 100% prior to placing units in finished goods. Other paragraphs are parameters which may be tested on a sampling basis at the discretion of Quality Assurance or as specified in the customer purchase order.

2. DESCRIPTION OF EQUIPMENT

2.1 KRT 127

The KRT 127 is a radio control receiver designed to be mounted in a Target Holding Mechanism-Tank Gunnery (THM-TG). The KRT 127 receives Frequency Modulated (FM) control signals in the 136 to 160 MHz band and converts them to the discrete outputs required to activate the features of the THM-TG selected by the operator of the transmitter. The baseband data signal is a low data rate (approximately 60 Bits per Second) Audio Frequency Shift Keyed (AFSK) which contains bits to address individual targets or groups of targets and cause the addressed target(s) to raise, lower, or fire a gunfire simulator. The details of the signal format are described in Section 5 of this specification.

The KRT 127 incorporates the receiver-transmitter RT-1594/PRC-127 of the AN/PRC-127 handheld radio as the RF to baseband section. A separate decoder module is provided to convert the baseband signal to the discrete outputs to activate the THM-TG.

The RT-1594/PRC-127 and the decoder module are enclosed in a waterproof box in order to provide the environmental protection required in the customer's operating environment. The mounting tray, which provides mounting for the antenna and the mechanical interface to the next higher assembly, is an integral part of the unit.

Within the frequency range of 136 to 160 MHz, The KRT-127 is required to be compatible with the THM-TG transmitter as defined by MIL-T-70834(AR).

2.2 BACKGROUND

The Target Holding Mechanism-Tank Gunnery (THM-TG) is the next higher assembly to the KRT-127. It is used by the U.S. Army at a variety of installations. It contains an electrically powered hydraulic mechanism for raising and lowering silhouette targets of tanks and other vehicles to provide target practice and evaluation for tanks, other ground weapon systems, and helicopter gunships. The mechanism is approximately 18 inches tall by 56 inches long by 24 inches wide and weighs 327 lbs. The THM-TG is normally powered by a 12 volt lead-acid storage battery. The Government furnished sample THM-TG used in the development of the KRT 127 was supplied with a Sears Die-Hard 70 Ampere-Hour deep cycle marine battery. The targets it raises and lowers are typically a full 4' x 8' sheet of ¾" plywood or larger.

In use, the THM-TG is typically placed in a trench below the line of fire or behind an earth berm to protect it from weapons fire, so that only the target is exposed when raised. THM-TGs are typically left outside in their range emplacements for several weeks at a time, and brought indoors only occasionally for maintenance or storage. Because users do not always construct the emplacements with the required drainage capabilities, the THM-TG, to include the KRT 127, may experience submersion for several hours to several days at a time.

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This would typically occur as a result of a storm over a weekend or holiday. The THM-TG and KRT-127 are not required to operate submerged, but the applicable submersion specifications are to insure that the equipment will survive such soakings and be capable of return to service after drying and external cleaning

The transmit end of the radio control link is a man-portable transmitter having a RF power output of approximately 6 watts. It is typically used with a rubber duck antenna approximately one foot long. Per the existing technical manuals, operating ranges from the target can be as much as 2.5 miles (approximately 4000 meters), or essentially the maximum effective range of the main gun of a tank. The operator of the transmitter will normally position himself to be able to observe both the target and the tank firing at it in order to record scores.

The KRT 127 is a replacement for an existing receiver design owned by the customer (U.S. Army). At the time of original design of the KRT 127, the design of the THM-TG next higher assembly and the previous receiver were under the control of U.S. Army Armaments, Munitions, and Chemical Command, Rock Island Arsenal, Illinois. Refer to Contract DAAA09-92-C-0542 for traceability of key parameters of the KRT 127 design to the previous customer design which it replaces. The intent behind the development of the KRT 127 design was to provide a replacement receiver which would take advantage of the existing logistical supportability of the RT-1594/PRC-127 in the Army inventory, and that would overcome the supportability problems associated with obsolete components in the decoder circuitry of the previous design.

The design of the KRT 127 was reverse engineered from several sources of available information rather than being derived from a pure set of functional requirements. The KRT 127 decoder board logic was created by transferring (as much as possible) the discrete component logic diagram of the previous receiver to an Electrically Programmable Logic Device (EPLD).

3. REFERENCE DOCUMENTS, ACRONYMS AND ABBREVIATIONS

3.1 REFERENCE DOCUMENTS

KRT 127 Product Structure Diagram, AlliedSignal Drawing 000-00913-0000

NEMA Standards Publication 250-1985, Enclosures for Electrical Equipment (1000 Volts Maximum)

USACECOM Specification A3186103 U.S. Army Non-Hardened Small Unit Radio Receiver/Transmitter RT-1594/PRC-127 Critical Item Product Function Specification (Draft) 22 June, 1992

MIL-T-70835(AR) Military Specification Transmitter Assembly: 11784701 Initial Draft, 24 October, 1988

MIL-STD-810D Environmental Test Methods and Engineering Guidelines 19 July, 1983

Contract DAAA09-92-C-0542

TM 11-5820-1048-24&P Unit, Direct Support and General Support Maintenance Manual (Including Repair Parts And Special Tools List), Radio Set AN/PRC-127

3.2 ACRONYMS AND ABBREVIATIONS

EPLD	Electrically Programmable Logic Device
FM	Frequency Modulation
THM-TG	Target Holding Mechanism-Tank Gunnery
AFSK	Audio Frequency Shift Keying

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VSWR	Voltage Standing Wave Ratio
GFE	Government Furnished Equipment
TBD	To Be Determined

4. CONDITIONS FOR TESTING

4.1 GENERAL CONDITIONS

Unless otherwise stated, all tests shall be conducted under the following conditions.

Ambient room temperature: 25 degrees Celsius, +/- 10 deg. C.

Ambient room pressure and humidity.

Due to the frequent access to the user controls required during room temperature testing, the unit may be tested with the cover to the waterproof enclosure in place, but not fastened. While the unit will not have the cover removed in normal operation, the user will be required to remove it for initial setup of the unit

Input signals may be generated by combinations of general and special purpose test equipment, or by a GFE (Government Furnished Equipment) transmitter at the discretion of the procuring activity.

NOTE: *Due to RF signal leakage typically encountered with GFE transmitters and the difficulty of controlling key signal parameters, full compliance with this specification cannot be verified with this approach. Partial compliance may be verified by functional testing, but tests such as sensitivity requiring calibrated measurements cannot be guaranteed with GFE transmitters.*

Power Supply Voltage: 12 VDC +/- 0.2 VDC

The RT-1594/PRC-127 will be programmed with the following parameters:

Channel 0 ID will be set to the vendor serial number of the RT-1594/PRC-127

Channel 0 Transmitter Time-out Timer will be set to 0.0 seconds (Time-out Timer disabled)

Channel 0 Scan Delay will be set to 2.0 SEC

Channel 0 Group 1 features: Features 1 through 3 steady, Features 4 and 5 flashing

Channel 0 Group 2 Features 1 through 5 steady.

Channel 1 Transmit and Receive frequencies 136.025 MHz.

Channel 2 Transmit and Receive frequencies 147.000 MHz.

Channel 3 Transmit and Receive Frequencies 149.000 MHz.

Channel 4 Transmit and Receive Frequencies 159.900 MHz.

NOTE: *The KRT 127 must be tested on at least two frequencies that are integer multiples of 1.000 MHz. This is to verify that harmonics of the 1.000 MHz clock oscillator of the decoder board are adequately suppressed to allow the overall unit to achieve rated sensitivity.*

Receive Frequencies for all other channels shall be set to 147.100 MHz or to the frequencies of the GFE transmitter if applicable.

Transmit Frequencies for all other channels shall be set to 0.0 MHz (disables transmitter for these channels)

Transmit and Receive Code Guard will be set to 0.0 (Code Guard disabled) for all channels.

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Refer to TM 11-5820-1048-24&P for programming instructions.

The volume control will be set to the maximum volume (fully clockwise) position.

The CG/Squelch control will be set to the maximum counterclockwise (short of detent) position.

Unless otherwise specified, discrete output lines may be monitored with visual indicators such as light bulbs or LEDs which provide a load with a permissible range between 100 and 2000 Ohms.

4.2 REQUIRED TEST EQUIPMENT

An arbitrary waveform generator, Hewlett Packard 8904A or equivalent capable of producing the baseband signal is required for testing.

At the discretion of the procuring activity, functional testing may be performed with a GFE THM-TG transmitter.

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5. ELECTRICAL SPECIFICATION OF UNIT INTERFACES

5.1 ANTENNA INPUT:

5.1.1 Impedance:

Not specified. Unit shall exhibit the required performance when tested with 50 Ohm test sources and measuring instruments.

5.1.2 Frequency Range:

136.000 to 160.000 MHz minimum

5.1.3 Signal Level:

-119 dBm (0.251 uVRMS) to -46 dBm (1000 uVRMS) as specified in individual tests. Unless otherwise stated, all RF signal levels shall be referenced to a 50 Ohm resistive load.

5.1.4 Modulation:

FM, 3 KHz deviation. Baseband modulating signal in normal operation is as illustrated below.

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FIGURE 5-1 BASEBAND SIGNAL TIMING

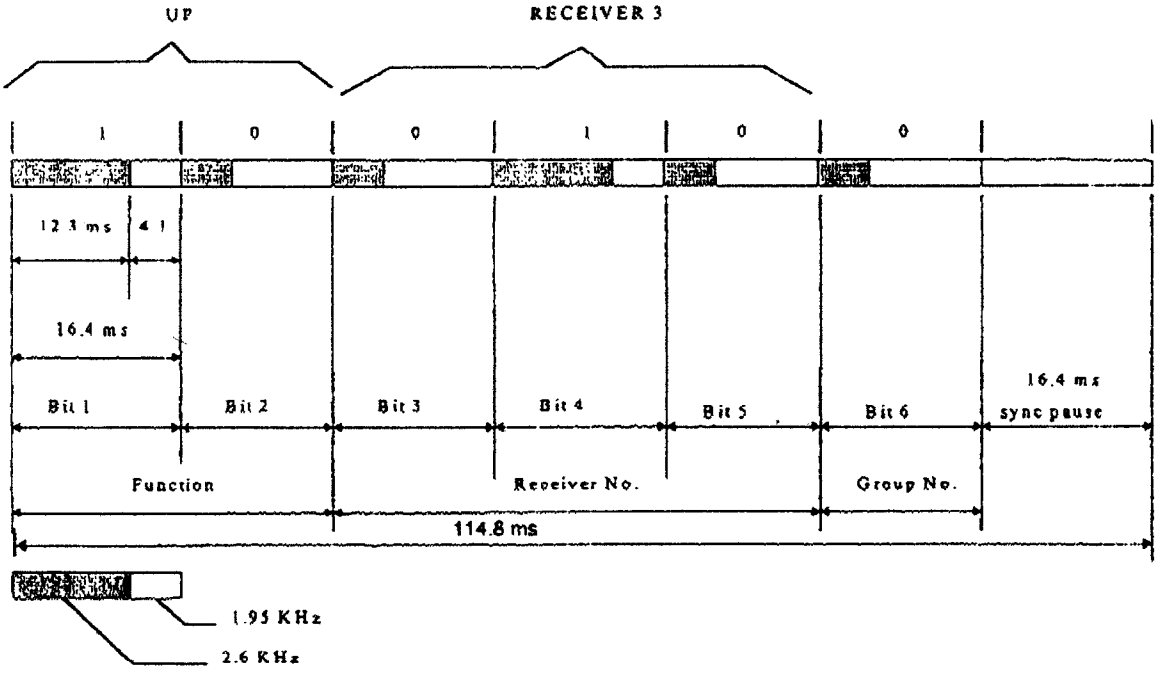

TABLE 5-1 BASESBAND SIGNAL CODING

FUNCTION	BIT 1	BIT 2
-------	0	0
FIRE	1	1
UP	1	0
DOWN	0	1

RECEIVER #	BIT 3	BIT 4	BIT 5	BIT 6
1	0	0	0	0
2	1	0	0	0
3	0	1	0	0
4	1	1	0	0
5	0	0	1	0
6	1	0	1	0
7	0	1	1	0
8	1	1	1	0
1-8 (GROUP)	0	0	0	1

For a standard test signal, the message is repeated 5 times. (Note: The available government furnished documentation and specifications on the transmitter state that the message will be repeated for 0.6 seconds (no tolerance stated) for a single momentary push of a button on the transmitter. This corresponds to approximately 5 repetitions of the message. The message repeats indefinitely for as long as a transmit button is held down if the button is held down for longer than 0.6 seconds. Testing of the single Government furnished transmitter (Serial #1301) provided during the development of the KRT-127 indicated that the transmit interval is not precisely controlled. The Government furnished transmitter had a transmit interval

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which varied between a minimum of 924 milliseconds and a maximum in excess of 1 second. Further, testing indicated that the transmit interval is not indexed to a particular number of message repetitions.

Other specifications and/or tolerances not provided in the Government furnished documentation are:

audio tone frequencies

short tone interval

long tone interval

overall message interval

time from transmitter keying to start of first message

Variation in these parameters observed in testing of transmitter serial # 1301 are as follows:

low tone frequency (1.95 KHz nominal) 1.934 KHz min., 1.965 KHz max.

high tone frequency (2.60 KHz nominal) 2.543 KHz min., 2.679 KHz max.

short tone interval (4.1 milliseconds nominal) 3.58 milliseconds min., 4.30 milliseconds max.

long tone interval (12.3 milliseconds nominal) 12 24 milliseconds min., 12.80 milliseconds max.

overall message interval (114.8 milliseconds nominal) 113.6 milliseconds min., 115.2 milliseconds max.

time from transmitter keying to start of first message (not specified) 4.62 milliseconds min., 8.48 milliseconds max.

5.2 J104 ANTENNA IN/OUT

5.2.1 VSWR

4:1 max. 136.000 TO 160.000 MHz when tested with antenna installed using RT-1594/PRC-127 in the transmit mode or 50 Ohm resistive test source. (Note: The VSWR measurement has several functions. One is to maintain a level of assurance of overall system sensitivity without resorting to more expensive field testing strategies of the unit in its installed environment (assumes minimal resistive losses in the antenna). Another is to preserve the option for future design upgrades which would take advantage of the transmit capability of the RT-1594/PRC-127 to provide a return communications link for scoring and/or diagnostic functions.

5.2.2 Other Transmitter Characteristics

To be determined contingent on any decisions to incorporate a transmit feature in the KRT-127. Transmitter characteristics shall be within the capabilities of the RT-1594/PRC-127 as defined by USACECOM Specification A3186103.

5.3 J105 POWER IN/CONTROL OUT

5.3.1 Pin A Ground

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5.3.2 Pin B Power Input

10 to +15 VDC, +12 VDC Nominal with output pins unloaded

250 mA max. receive

100 mA max. standby

transmit TBD

With output pins loaded with 100 Ohm resistors

400 mA max. receive

100 mA max. standby

transmit TBD

5.3.3 Pin C Audio Out

This output is for test and troubleshooting purposes only. It is not loaded during normal operation. During normal operation output will be between 2.6 and 15 V Peak to Peak unloaded while receiving specified test signals. This output may have an unspecified DC offset. A typical value for this DC offset is 2.0 volts when operating on a 12 volt supply, 5.8 volts when operating on a 15 volt power supply.

5.3.4 Discrete Outputs

The following pins shall be discrete outputs with functions as indicated.

Pin D (Target) Up (discrete)

Pin E (Target) Down (discrete)

Pin F Fire (discrete)

Pin G No connection

For the above discrete outputs, the following characteristics apply.

On state shall be +9 to +15 VDC (switched Power Supply Voltage), 12 VDC Nominal, able to source 90 mA minimum with no more than 1 volt drop from Power input voltage. Timing IAW Figure 5-2 (INPUT/OUTPUT TIMING). Off state shall be less than 0.5 volts across a 100K Ohm resistor. Off state shall present an impedance of 2K Ohms to ground or greater as viewed by an external source of 15 volts DC or less.

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5.4 OUTPUT SIGNAL TIMING

The timing of the discrete output signals shall fall within the envelope illustrated in Figure 5-2 below.

FIGURE 5-2 INPUT/OUTPUT TIMING

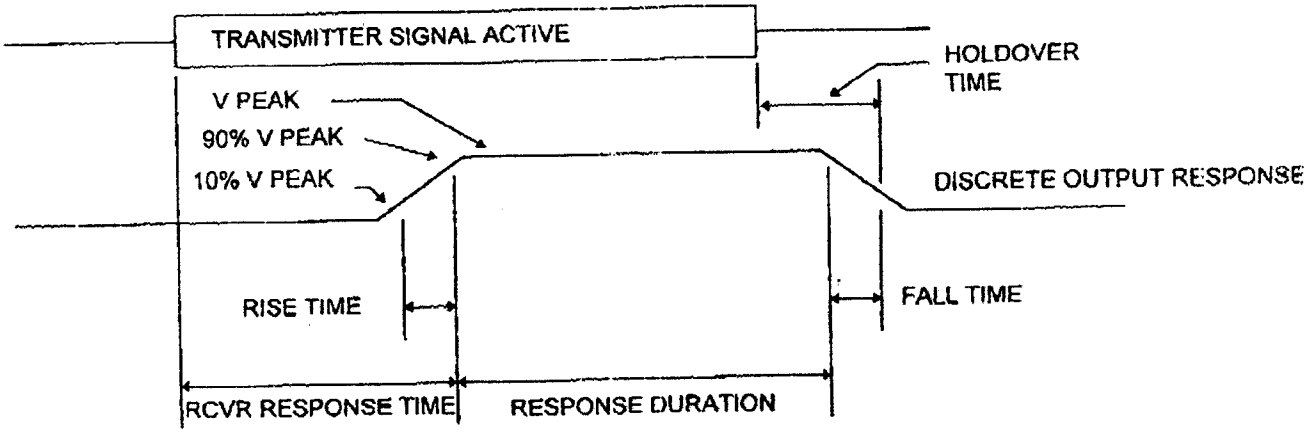

TABLE 5-2 OUTPUT WAVEFORM PARAMETERS

PARAMETER	MINIMUM	MAXIMUM
V PEAK	V supply minus 1 Volt	V supply
RCVR RESPONSE TIME	210 ms (see note)	574 ms
RESPONSE DURATION	100 ms	N/A
HOLDOVER TIME	-244 ms (see note)	100 ms
RISE TIME	N/A	5 ms
FALL TIME	N/A	5 ms

Note:, Minimum rcvr response time shall be not earlier than the end of bit 6 of the second message of the transmitted signal. For a signal composed of nominal length bits, this is 213.2 ms. 210 ms is selected as a test value to allow for test equipment tolerances. When testing with a GFE transmitter, a test limit of 200 ms applies. 200 ms is calculated assuming two messages composed of minimum observed length tones (of the GFE transmitter). This yields a nominal limit of 205.66 ms. Test limit is set at 200 ms to provide an arbitrary margin for variation among transmitters. Holdover Time: in other words, a standard 6 message test signal shall produce a single discrete output pulse at least 100 ms long, commencing sometime between the end of bit six of the second message and the end of the 5 message string.

6. MINIMUM PERFORMANCE UNDER STANDARD CONDITIONS

6.1 VSWR

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4:1 max. 136.000 TO 160.000 MHz when tested with antenna installed using RT-1594/PRC-127 in the transmit mode or 50 Ohm resistive test source.. Alternative test methods may be used in order to avoid unlicensed RF radiation, as long as the VSWR is measured relative to a 50 Ohm source. KRT 127 must be installed in THM-TG for valid VSWR test.. This test is only required when specifically directed by the procuring activity.

6.2 OTHER TRANSMITTER CHARACTERISTICS

To be determined contingent on any decisions to incorporate a transmit feature in the KRT-127. Required transmitter characteristics shall be within the capabilities of the RT-1594/PRC-127 as defined by USACECOM Specification A3186103.

6.3 MINIMUM SUCCESSFUL RESPONSE RATE

The KRT 127 must have a minimum 99% success rate in providing the correct response to a series of 5 identical messages addressed to the unit under test applied to the antenna input port at the specified minimum sensitivity level. (Note: The original specifications for the THM-TG receiver do not address required success rate in message response. Testing will not normally be required to demonstrate this 99% criteria. However, in the event that an unexplainable failure is encountered in normal testing, successful demonstration of the 99% criteria shall constitute adequate performance. The 99% level is based on an engineering estimate of how such a failure would be viewed by a field user. Other causes of failure to activate such as masking of antennas, low batteries on the transmitter, less than optimum transmitter locations, RF interference, not pushing the transmit button hard enough the first time, etc. would occur frequently enough that the operator would probably not perceive an equipment problem. Instead, he would just push the transmit button again and continue operation.)

6.4 MAXIMUM ERRONEOUS RESPONSE RATE

In the case of potential erroneous responses, no action (THM-TG behaves as if no message were received) is the preferred response. In this context, action is anything which would cause the THM-TG to change states. For example, a "lower" command received immediately after a "raise" command but erroneously decoded as a "raise" command would be scored as a "no action" because the THM-TG would remain in a raised state. The same lower command erroneously decoded as a "fire" command would be scored as an action because the THM-TG would fire the gunfire simulator, which would constitute a change in state. The KRT 127 shall have a total response rate that is at least 99.9% free of erroneous action responses when tested with the specified input RF signal at the minimum sensitivity level. (Note: This 1/1000 error rate criteria is selected based on an engineering estimate of how such a failure would be viewed by a field user. Under estimated heavy usage conditions, a 1/1000 error would be expected to occur every 2-3 days of use. Under such circumstances, an operator would often wonder if he accidentally pushed the wrong button. In the cases where he was confident that he had pushed the correct button, the machine error would probably be perceived as something that can happen, but that doesn't happen very often.)

6.5 MINIMUM ERRONEOUS ADDRESS REJECTION RATE

The KRT 127 must have a minimum success rate of 99.9% in rejecting messages not addressed to the unit under test.

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(Note: The original specifications for the THM-TG receiver do not address required success rate in erroneous message rejection. Testing will not normally be required to demonstrate this 99.9% criteria. However, in the event that an unexplainable failure is encountered in normal testing, successful demonstration of the 99.9% criteria shall constitute adequate performance. The 1/1000 error rate criteria is selected based on an engineering estimate of how such a failure would be viewed by a field user. Under estimated heavy usage conditions, a 1/1000 error would be expected to occur every 2-3 days of use. Under such circumstances, an operator would often wonder if he accidentally pushed the wrong button. In the cases where he was confident that he had pushed the correct button, the machine error would probably be perceived as something that can happen, but that doesn't happen very often.)

6.6 * RECEIVER SENSITIVITY

Note: Sensitivity tests may be performed using lamps or other visual indicators to monitor the condition of the discrete output lines. Monitoring equipment shall present a resistive load with permissible values between 100 and 100K Ohms to the output lines.

6.6.1 * SENSITIVITY AT MAXIMUM SQUELCH

With the CG-SQ control of the RT-1594/PRC-127 set to the maximum counterclockwise position short of detent and the RF input signal level at the antenna input jack set to no more than -106 dBm (1.12 microvolts RMS), the KRT 127 shall correctly respond to the commands of the standard test signal which are addressed to it. The KRT 127 shall correctly reject all commands of all signals not addressed to it. This shall be verified for all combinations of transmit signal addresses (Target numbers 1-8 and Group Call) and receiver address switch settings (1-8). To avoid unnecessary repetition, receiver address switch settings 1 and 2 will be tested at a transmitter and receiver frequency of 136.025 MHz. Settings 3 and 4 will be tested at a frequency of 147.000 MHz. Settings 5 and 6 will be tested at a frequency of 149.000 MHz. Settings 7, 8, and 1-8 (group call) will be tested at 159.900 MHz. The channel control of the RT-1594/PRC-127 will be adjusted as required to match the transmit frequency.

Note: AlliedSignal experience with the GFE transmitter is that it is only suitable for functional testing. RF leakage prevents accurate sensitivity measurements. When testing with a GFE transmitter, receiver frequencies will be selected to be compatible with those installed in the transmitter. Selection will be made among available transmitter frequencies to test, as much as possible, high, middle, and low portions of the 136.000 to 160.000 MHz frequency range of the KRT-127 with at least one frequency in each portion of the band.

6.6.2 * Sensitivity Unsquelched

With the CG-SQ control of the RT-1594/PRC-127 set to the maximum clockwise position and the RF input signal level at the antenna input jack set to no more than-109 dBm (0.8 microvolts RMS), the KRT 127 shall correctly respond to the commands of the standard test signal which are addressed to it. The KRT 127 shall correctly reject all commands of all signals not addressed to it. This shall be verified for a total of three receiver address switch settings (1,8, Group Call). To avoid unnecessary repetition, receiver address switch setting 1 will be tested at a transmitter and receiver frequency of 136.025 MHz. Setting 8 will be tested at a frequency of 149.000 MHz. Group Call will be tested at 159.900 MHz. The channel control of the RT-1594/PRC-127 will be adjusted as required to match the transmit frequency. Testing rejection of erroneous address messages is not normally required at this point because it is covered in paragraph 6.6.1 above.

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Note: AlliedSignal experience with the GFE transmitter is that it is only suitable for functional testing. RF leakage prevents accurate sensitivity measurements. When testing with a GFE transmitter, receiver frequencies will be selected to be compatible with those installed in the transmitter. Selection will be made among available transmitter frequencies to test, as much as possible, high, middle, and low portions of the 136.000 to 160.000 MHz frequency range of the KRT-127 with at least one frequency in each portion of the band.

6.7 VERIFICATION OF OUTPUT WAVEFORMS

Output waveforms shall be verified for all discrete output lines (up, down, fire). These waveforms shall be verified under both minimum and maximum load (100 K and 100 Ohm resistors to ground respectively).

6.7.1 Off State of Discrete Output Lines

Off state of all discrete output lines (up, down, and fire) shall be verified to be in conformance with Section 5 above.

6.7.2 V Peak

V Peak shall conform to Table 5-2.

6.7.3 Receiver Response Time

Receiver response time shall conform to Table 5-2.

6.7.4 Response Duration

Response duration shall conform to Table 5-2.

6.7.5 Holdover Time

Holdover time shall conform to Table 5-2.

6.7.6 Rise Time

Rise time shall conform to Table 5-2.

6.7.7 Fall Time

Fall Time shall conform to Table 5-2.

6.8 * POWER INPUT

Input current shall be verified to conform to paragraph 5.3.2 at nominal input voltage (12 +/- 0.2 VDC) for both loaded and unloaded conditions.

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7. MINIMUM PERFORMANCE UNDER ENVIRONMENTAL CONDITIONS

Unless otherwise specified below, all electrical requirements shall be met under the environmental conditions specified in this section.

7.1 POWER SUPPLY VOLTAGE VARIATION

Input current shall be verified to conform to paragraph 5.3.2 for conditions of minimum input voltage, and maximum input voltage

7.1.1 Low Power Supply Voltage

For power supply voltages down to 10 VDC, there shall be no derating of KRT-127 performance. For power supply voltages below 10 VDC, the KRT-127 shall not be damaged, but may experience unspecified derating of performance.

7.1.2 High Power Supply Voltage

At power supply voltages from 12.2 VDC to 15 VDC, the KRT-127 shall operate without damage but may experience unspecified loss of sensitivity and immunity to RF interference with desired signals. There shall be no degradation in the ability of the unit to reject messages not containing its digital address (target number).

7.2 TEMPERATURE

This test simulates the temperature extremes of the operating environment of the KRT 127.

7.2.1 High Temperature (Test adapted from MIL-STD-810D, Method 501.2)

Except as noted below, the unit must meet all electrical performance parameters specified in Section 6 at a temperature of +60 degrees Celsius (140 degrees F).

Sensitivity may derate up to 6 dB.

7.2.2 Low Temperature (Test adapted from MIL-STD-810D, Method 502.2)

Except as noted below, unit must meet all electrical performance parameters at a temperature of -30 degrees Celsius (-34.4 degrees F).

Sensitivity may derate up to 6 dB.

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7.3 SUBMERSION (Test adapted from Mil-STD-810D, Method 512.2)

The KRT 127 is not required to operate while submerged. However, it must be capable of completing the submersion requirements without observable leakage of water into the waterproof housing. In order to provide an accelerated test, this procedure simulates a water depth greater than the anticipated depth that might be encountered in actual use.

This test shall be performed on a minimum of 10% of all housing assemblies (with window and external connectors installed) prior to installation of the RT-1594/PRC-127 and the decoder module. If any failures are detected, then a minimum of the last 30 and the next 20 housings produced shall undergo 100% testing on this parameter. (To the maximum extent possible within the size of the purchase order and the number of units not yet shipped.)

This test may be performed on a sampling basis on complete KRT 127 units at the discretion of Quality Assurance or as specified in the procurement contract.

With the cover of the waterproof housing loosened, the unit shall be heated to a temperature of 27 deg. C (49 deg F) above the temperature of the water, in order to provide a delta T of at least 27 deg C (49 deg F) between the heated temperature of the unit and the water. This delta T is for the purpose of increasing the difference between external and internal pressures acting to force water into the enclosure.). A pressure depth of 2 meters may be substituted for the delta-T requirement.

The cover shall be secured (tightened to normal operating configuration) before the unit is allowed to cool.

The unit shall be immersed in water to a minimum depth of 1 meters (3.28) feet for a minimum of 2 hours. Water temperature shall be 18 deg C +/- 10 deg C (64 deg F +/- 18 deg F).

At the end of the immersion time, the external surfaces of the unit shall be dried and the unit examined, both through the window and with the cover removed for any signs of moisture penetration into the enclosure. There shall be no evidence of moisture penetration visible to the naked eye.

If approved by the procuring activity (customer), a 4 hour submersion time at a depth of 30 inches may be substituted for the delta T / delta P requirement.

7.4 CORROSION RESISTANCE

The completed unit with all covers, gaskets, external connectors, and seals installed/connected must meet the corrosion resistance requirements of NEMA Publication 250 for type 4X enclosures.

7.5 VIBRATION (Test adapted from MIL-STD-810D, Method 514.3-I)

This test is to determine the survivability of the KRT 127 in the anticipated vibration environment for shipping and handling. The KRT 127 is not required to function while being vibrated.

The KRT 127 shall meet the requirements of Section 6 after one hour of random vibration along each major axis IAW MIL-STD-810D, Method 514.3-I, Table 514.3-I, Category 1, Basic Transportation, Equipment carried as secured cargo, common carrier environment. After vibration, the unit cover will be removed and the unit disassembled sufficiently to permit examination of the internal cabling. (The RT-1594/PRC-127 will not be disassembled.) In general, there will be no evidence of wear or damage to the unit. Inspection will specifically

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verify that there is no visible fraying or other damage to the cabling of the unit. Inspection will also specifically check for evidence of impact between exterior surfaces of RT-1594/PRC-127, exterior surfaces of the decoder module, and interior surfaces of the waterproof enclosure, to include the connectors mounted to the waterproof enclosure.

7.6 SHOCK (Test adapted from MIL-STD 810D, Method 516.3)

This test is to determine the survivability of the KRT 127 in the anticipated impact environment for shipping and handling. The KRT 127 is not required to function during impact.

The unit shall meet the electrical requirements of Section 6 above, the high and low temperature requirements, the high and low supply voltage requirements, and the immersion requirements after being subjected to the transit drop shock test IAW MIL-STD-810D Method 516.3, Procedure 4. Summarized, this is a total of 26 drops of 122 cm (48 inches) onto 2 inches of plywood backed by concrete. The drops may be distributed over a total of up to 5 test items. Unit will be oriented so that it is dropped onto each surface, each edge, and each corner of an assumed rectangular boundary prism. Cosmetic damage and other deformation may occur, as long as the damage does not preclude the unit from being mounted in the next higher assembly (THM-TG) and does not prevent access to the user controls. Opening and reseating the lid to the waterproof enclosure is permissible between the shock and immersion tests.

8. * PROGRAMMING THE KRT 127 TO SHIPPING CONFIGURATION

The RT-1594/PRC-127 will be programmed with the following parameters prior to being packaged for shipping:

Channel 0 ID will be set to the vendor serial number of the RT-1594/PRC-127

Channel 0 Transmitter Time-out Timer will be set to 0.0 seconds (Time-out Timer disabled)

Channel 0 Scan Delay will be set to 2.0 SEC

Channel 0 Group 1 features: Features 1 through 3 steady, Features 4 and 5 flashing

Channel 0 Group 2 Features 1 through 5 steady.

All channels Receive frequency 147.100 MHz.

Transmit Frequencies for all channels shall be set to 0.0 MHz (disables transmitter)

Transmit and Receive Code Guard will be set to 0.0 (Code Guard disabled) for all channels.

Refer to TM 11-5820-1048-24&P for programming instructions.